Mapping Digitalization in the Crafts Industry: A Systematic Literature Review

Research Paper

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Abstract. The craft or skilled trades industry plays a crucial economic and societal role worldwide. Yet, it is often viewed as lagging behind other industries in digital transformation (DT). This paper contests that notion by offering a systematic literature review that highlights active and diverse patterns of digital technology adoption across different craft sectors. Specifically, the paper examines 141 out of 1,500 scientific papers and practitioner outlets to map the application and influence of specific digital technologies within various craft sectors. The findings indicate that the integration of different digital technologies across sectors has diverse impacts on organizations, driving distinct dimensions of DT (such as value creation, value proposition, customer interaction, and their combinations) in each sector. Recognizing gaps in digital technology integration in the craft industry, we propose potential enhancements to the focus of DT initiatives in specific areas and recommend future research directions.

Keywords: crafts, digital transformation, digitalization, skilled trades, systematic literature review

1 Introduction

Around the world, craft businesses (CBs) contribute to the economic growth, cultural identity, and national branding of many countries (Mignosa & Kotipalli 2019). For example, 16.6% of all companies in Germany are in the craft industry, accounting for approximately 7.4% of the GDP (GFSO, 2022a). In the U.S. the craft industry is famous for its "Do-it-yourself" mentality and innovativeness (Talen, 2014; Luckman, 2015). In Italy, craftsmanship, especially in the fields of fashion and design, has long been an integral part of the country's national culture and branding. This is exemplified by the phrase "Made in Italy," which highlights the country's expert artisanal competencies in producing high-quality and luxury products (Minini, 2024). Hence, craftsmanship plays a crucial role in the economy and society worldwide (Colombo,

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2007; Mignosa & Kotipalli, 2019). However, current literature often portrays crafts or skilled trades as traditional and trailing behind other industries, particularly in terms of digital transformation (DT) (Kocak & Pawlowski, 2023). Hence, this industry appears to be missing technological and business opportunities, as well as social trends. This perception is partly due to craftsmanship having traditional roots and being associated with manual skills, handiwork, and heritage techniques (Gandini & Gerosa, 2023). Additionally, craft enterprises are usually small to medium-sized companies (SME). For instance, CBs in Germany have an average of nine employees (GFSO, 2022b).

Paradoxically, craftsmanship itself develops alongside technological innovations (Gandini & Gerosa, 2023). The so-called neo-craft movement exemplifies how craftspeople preserve traditional methods while actively driving innovation within their trades by adopting new equipment or techniques (Ratten et al., 2017). Recent studies further suggest that many CBs embrace technologies to enhance production efficiency and management processes (Überbacher et al., 2020). However, rather than opposing tradition and technology, neo-craft reframes this relationship as hybrid and complementary by representing a particular form of digitally-mediated manual labor, in which the boundaries between craft and innovation blur (Gandini & Gerosa, 2023). Thus, it offers a promising perspective to broaden DT research, highlighting how technology adoption in craft is not only driven by efficiency but also by identity, cultural significance, and a reinterpretation of craft values (Leonardi & Pareschi, 2025).

Nevertheless, the current technological uptake in the crafts industry has been selective at best because of several challenges (Überbacher et al., 2020). There are concerns over cost, skills gaps, structural or cultural barriers, and the perceived threat to the authenticity of craftsmanship (Überbacher et al., 2020; Thonipara et al., 2023; Gandini & Gerosa, 2023; Anwar, 2024). Additionally, the successful adoption of certain technologies (e.g., social media or online platforms) can vary across craft sectors and regional locations, such as rural versus urban areas (Busch et al., 2021; Thonipara et al., 2023). Consequently, there remains a need to clarify the extent to which emerging technologies are adopted and influence diverse skilled trades.

This paper thus seeks to answer the following questions: (1) What is the degree of digitalization across craft sectors? (2) For which real-world tasks do CBs in specific skilled trades implement these digital technologies? (3) Which impact types and corresponding dimensions of DT emerge as the foci of innovation in each craft sector?

Answering these questions helps identify not only current trends in each craft sector but especially gaps in CBs' choice and capitalization of digital technologies (e.g., awareness or appropriation of unexplored or alternative DT tools) and potential improvements in the focus of DT initiatives in specific sectors (e.g., which dimensions of DT can be better developed). Building on this, our findings challenge the assumption that CBs are uniformly resistant to DT. Instead, they reveal a strategic selectivity in adoption patterns, with many integrating DT tools to enhance production and efficiency while maintaining core craft values. This nuanced approach suggests a need to revisit SME DT models to account for sectors where tradition and innovation coexist.

To address this inquiry, we conducted a systematic literature review (SLR). The next section elaborates on the context and framework of the study. The methodology section

presents the SLR approach employed. Subsequently, the findings and future research recommendations are presented and evaluated in the concluding sections.

2 Literature Review

2.1 Digital Transformation in the Craft Industry

DT shapes the global social and economic landscape. In contrast to *digitization*, the process of transforming information into digital format (Gradillas & Thomas, 2023), and *digitalization*, the process of boosting levels of automation by employing innovative technologies (Gradillas & Thomas, 2023), DT encompasses a wider concept. It entails a more profound and thorough incorporation of digital technologies into numerous aspects of business operations (Gershenfeld, 2012; Pousttchi et al., 2019), aiming to elevate performance and broaden reach (Anwar, 2024).

The craft industry encompasses a diverse range of skilled trades, each requiring specialized knowledge and expertise. In Germany, for instance, the German Confederation of Skilled Crafts and Small Businesses (Zentralverband des Deutschen Handwerks, ZDH) has classified these trades into broader groups: construction and finishing, electrical and metalworking, woodworking and plastics, clothing, textiles and leather, food, health and personal care, chemicals and cleaning, and graphics (Zentralverband des Deutschen Handwerks, 2024). However, craftsmanship also covers *traditional crafting*, characterized by handmade artifacts (KPMG, 2016), and *neo-craft*, which incorporates modern technologies into the production process to innovate (Gandini & Gerosa, 2023).

Craft businesses are typically smaller in scale compared to large manufacturers and rely on highly skilled artisans to produce customized or small-batch goods (Garavaglia et al., 2020). The term 'craft' itself is multi-faceted, often encompassing both traditional and contemporary practices that involve skills in creating objects by hand with both functional and aesthetic value (Gutierrez et al., 2022).

Although the craft industry may appear less willing to embrace changes due to associated risks, it often demonstrates a remarkable ability to achieve high levels of innovation with limited resources (Überbacher et al., 2020). This paradox highlights a deep-seated ingenuity inherent in craftsmanship, where traditional techniques are continually improved and adapted, often integrating new tools and technologies (Überbacher et al., 2020). In this sense, the craft industry is not heavily resistant to change but rather possesses an innate innovative potential (Überbacher et al., 2020).

Nevertheless, the craft industry is perceived as lagging behind in DT compared to other sectors because the increasing integration of digital technologies presents both opportunities and unique challenges for CBs. Digital technologies enhance efficiency, market reach, and innovation but their implementation remains inconsistent in the craft sector due to structural and cultural barriers (Morakanyane et al., 2017; Überbacher et al., 2020). Research further suggests that regional disparities play a crucial role, with urban businesses having better access to digital infrastructure compared to their rural

counterparts (Busch et al., 2021). Most importantly, DT in CBs is not uniform across sectors. Communication and other enabling technologies (Pousttchi et al. 2019), such as social media and e-commerce platforms, are embraced in CB for marketing and sales (Odoom et al., 2017; Taher, 2021), while more advanced production tools such as AI and IoT remain underutilized in certain sectors (Taher, 2021; Pomp et al., 2022). Business management technologies like ERP and CRM systems offer strategic advantages, but their adoption is hindered by resource limitations (Schwertner, 2017). Lastly, some CBs adopt digital tools to complement traditional practices, while others remain hesitant due to concerns over cost, skills gaps, or the perceived threat to craftsmanship authenticity (Gandini & Gerosa, 2023; Friesecke & Beuchel, 2024).

Yet these sectoral differences in adoption go beyond access or awareness. They reflect deeper organizational logics, especially in craft-based SMEs. To explain why certain technologies are adopted, this study draws on Trenkle's (2020) SME-specific DT framework. Based on case studies of German craft firms, it shows that adoption decisions are shaped by the owner's strategic vision, resource constraints, and the need to preserve artisanal values. Tools like ERP or CAD are favored when they support efficiency and personalization without compromising authenticity, while more disruptive technologies like AI are often avoided for fear of distorting core craft practices (Trenkle, 2020). By focusing specifically on SMEs, this framework provides a relevant analytical lens for understanding how DT in the craft sector is driven less by technological potential and more by context-sensitive integration.

2.2 Digital Technologies and Impact Types of Digital Transformation

DT encompasses a broad range of activities including the adoption of analytics (Chanias, 2017), social media (Horlacher and Hess, 2016), and more traditional technologies such as ERP systems (Westerman et al., 2011; Chanias, 2017) that change business activities in numerous ways. This paper focuses on classifying various digital technologies implemented in the craft industry and their corresponding impact on CBs, specifically in terms of the three dimensions of DT. We map out digital technologies in this way to provide insights into how CBs integrate digital solutions and the extent to which these technologies align with sector-specific demands.

According to the *technology impact types for DT* framework (Pousttchi et al. 2019), the impact of DT on businesses can be categorized into three dimensions: value creation, value proposition, and customer interaction. *Value creation* focuses on how digital technologies influence business processes, organizational structure, and workforce. The kinds of impact DT has on organizations under this dimension include process alignment, staff empowerment, data exploitation, and networking. *Value proposition* relates to how DT affects the choice and creation of products and services offered to the market, as well as the revenue models that accompany them. This dimension encompasses impact types such as business development, product innovation, and to a certain extent marketing, for instance, in terms of (re)branding. *Customer interaction* involves how companies engage with their customers, encompassing shifts in client behavior, customer relations, channel management, and

marketing strategies. This dimension emphasizes the impact of DT on customer service, user experience, loyalty, and communication channels. Overall, these dimensions facilitate a comprehensive understanding of the effects of DT on a company's operations, product offerings, and customer engagement. Building on these perspectives, it is essential to examine how different digital technologies are applied across craft sectors and the specific ways they influence business functions. While previous studies have highlighted the general benefits and challenges of DT in CBs, a more detailed understanding of its practical implementation is needed.

The following methodology section outlines the systematic approach taken to categorize, analyze, and assess DT adoption in CBs.

3 Methodology

3.1 Research Design

To investigate the depth and scope of DT within the craft industry, a systematic literature review (SLR) was employed as a research methodology. This study is based on the framework defined by Webster and Watson (2002), the PRISMA guidelines (Page et al., 2020). This approach ensured a comprehensive evaluation and synthesis of existing knowledge on DT in the craft industry, integrating various sources to identify patterns, challenges, and future directions.

3.2 Data Collection and Analysis

The SLR began by establishing relevant search terms (see Appendix A), to ensure the collection of comprehensive and relevant literature. This involved narrowing down the extensive literature towards the most relevant sources, from general technology use to specific applications in various craft sub-sectors. The keywords were then searched across academic databases, including Google Scholar, IEEE Xplore, EBSCO, and JSTOR, providing access to a vast array of scholarly articles, conference papers and book chapters. These records were screened based on relevance, focusing on studies examining DT in CBs, the use of digital tools, and regional variations in adoption. However, recognizing the potential gaps in academic literature, particularly in terms of practical implementation, the search was expanded beyond traditional academic sources. Additional real-world case studies and reports were gathered from reputable industry bodies and media, including the ZDH, the Frankfurter Allgemeine Zeitung, and the Deutsche Handwerks Zeitung, which provided valuable perspectives on how DT is applied in real-world craft business settings.

A PRISMA flow chart (Cf. Figure 1) illustrates the search and selection process. In total 141 scholarly and industry papers were retained for analysis, including 40 theoretical discussions on DT and 101 empirical case studies showcasing real-world implementation of DT in the craft industry. Although only the empirical cases were coded and analyzed, the theoretical papers informed our conceptual framework.

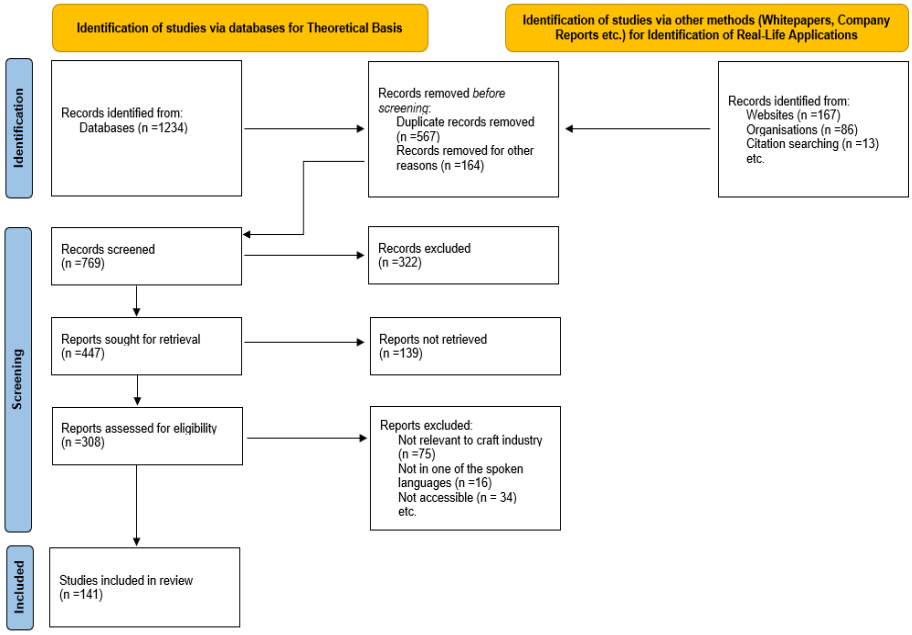

Figure 1: PRISMA Flow Diagram

3.3 Mapping and Categorization of Digital Tools and Technologies

To understand DT differences in the craft industry, CBs were classified into sectoral groups based on the ZDH classification (Zentralverband des Deutschen Handwerks, 2024). However, adjustments were made to better reflect sectoral distinctions. Plumbers, electricians, and heating and cooling technicians were grouped separately from construction due to their specialized operations and distinct DT adoption patterns. Similarly, architecture, woodworking, and furniture were classified under "Architecture and Design" instead of "Construction". Minor modifications included renaming "Health & Personal Care" to "Personal Care & Aesthetics" and integrating beverages into the food industry. The revised classification is shown in Table 1.

The next step was categorizing the digital technologies identified in the literature and case studies. We adopted a deductive approach, using the technology impact types framework (Pousttchi et al., 2019) as a basis. Technologies mentioned in the data were manually coded in Excel into three major areas: Communication and Other Enabling Technologies, Technologies Combining Hardware and Software in Intelligent Systems, and Data Technologies. Appendix B provides a detailed codebook that defines each code with examples, while Table 2 offers a brief overview of this categorization. To ensure consistency, coding was carried out manually by two researchers, who independently assigned each technology to a category. In the event of of discrepancies (e.g. overlapping uses), discussions were held to resolve the issue.

Table 1: List of Craft Sectors and Sub-sectors Used for Classification

Craft Sectors	Craft Sub-Sectors
Textile, Fiber Arts, and Footwear	Embroidery, Crocheting, Knitting, Textile, Fashion, Footwear, etc.
Architecture and Design	Architecture, Furniture, Woodworking, Urban Landscape, etc.
Food and Beverages	Bakery, Pastry, Brewery, Chocolate, Agriculture, Confectionery, etc.
Personal Care and Aesthetics	Hairdressing, Jewelry, Skincare and Cosmetics, Soap Maker, etc.
Construction	Construction, Carpentry, etc.
Traditional Handicraft	Glass, Basketry, Pottery, Plumbers, Electricians, Heating, etc.

Table 2: Categorization of digital tools and technologies (adapted from Pousttchi et al., 2019)

Technology Type	Examples of Digital Technologies	Key Functions
Communication and Other Enabling Technologies	3D Printing, 4D Printing, E-Commerce Platforms, Social Media, Radio Frequency Identification, Mobile Applications	Provide the foundation for digital connectivity, interaction, and networking
Technologies Combining Hardware and Software in Intelligent Systems	Mobile Devices, Stationary Devices, Augmented Reality (AR), Virtual Reality (VR), Robotics, Exoskeletons, Structural Sensors, Smart Textiles, Internet of Things (IoT), Digital Twins, Collaborative Robotics, Building Information Modeling (BIM)	Enhance manufacturing precision and automation through software-driven intelligent systems, optimizing processes
Data Technologies	Artificial Intelligence (AI), Machine Learning, Cloud Computing, Big Data Analytics, Predictive Maintenance, Data Visualization & Dashboards	Optimizing decision-making, operational efficiency, and predictive analysis

Although no qualitative software was used, and inter-coder reliability was not formally measured, consensus coding ensured consistency.

After categorizing CBs and digital technologies, a detailed mapping process was conducted to document the integration of these technologies across different craft sectors. We classified each technology based on its type, cause, impact type, and corresponding DT dimension (see Appendix C). This classification allowed us to identify how each technology influences business functions, highlighting key trends and variations across craft industry groups.

4 Results

Based on the SLR and initial mapping of digital tool adoption, the findings highlight trends in the DT of CBs, particularly how CBs are concretely implementing digital technologies and their functional roles. The analysis focuses on three key aspects: (1) the degree of digitalization across craft sectors, (2) the purposes for which CBs implement specific digital technologies, and (3) the corresponding impact classification of these digital technologies on the DT of each sub-sector, i.e., in terms of the dimensions of customer interaction, value creation, and value proposition.

4.1 Varying Degrees of Digitalization Across Craft Sectors

The analysis shows that the integration and type of digital tools vary significantly across craft sectors. Table 3 presents a selection of representative technologies used

across different craft sectors, illustrating how specific tools are leveraged to meet distinct business objectives. Appendix E provides a visual representation of technology adoption across sectors. The 101 case studies and reports on business applications revealed the following breakdown: 44% of the publications mentioned the application of "Technologies Combining Hardware and Software in Intelligent Systems." 29.8 % dealt with "Communication and Other Enabling Technologies," and 26.2 % referred to "Data Technologies." These underscore a significant trend toward applying more advanced digital solutions in CBs, driven by the need for efficiency, personalization, and competitive advantage in a rapidly evolving market (Schwertner, 2017).

Table 3. Application of Digital Technologies across Craft Sectors (selection)

Craft Sectors	**Digital Technologies**						
Textile, Fiber Arts, and Footwear	3D Configuration	AI supported robotic systems	AR	Digital Calendar	Social Media	Textile Screen and Tablets	ERP
Architecture and Design	3D Printing	AR	Computational Design Software	Parametric Design Software	Simulation Tools	Structural Analysis Software	
Food and Beverages	3D Planning	CAD Software	Digital Fabrication Techniques	Digital Marketing	Digital Twin		
Personal Care and Aesthetics	3D Printing	Digital Billing Systems	Digital Calendar	E-Commerce Platforms	AR		
Construction	3D Printing	Exosckeleton and AI	Structural Sensors	BIM	ERP	IoT	
Traditional Handicraft	3D Printing	3D Scanning	CAD Software	Digital Calendar	AR		

CBs in some sectors actively integrate sophisticated technologies, while others primarily rely on digital technologies for basic communication, marketing, and customer management. For example, the textile and fashion sector leverages AI, 3D modeling and virtual try-ons to enhance customization and customer engagement (Casciani and Chkanikova, 2023). Similarly, the construction sector incorporates BIM, IoT, and AR/VR technologies to improve project planning and execution (Pomp et al., 2022). In contrast, traditional crafts such as pottery, basketry, and woodworking remain less digitized, relying primarily on social media and e-commerce platforms for marketing and sales rather than advanced production techniques (Taher, 2021).

These differences suggest that sectors dealing with high precision, automation, and scalability (such as the construction or textile) tend to integrate hardware and software-driven intelligent systems to bring real added value by automating processes or facilitating visualization of complex projects (OECD, 2021). More traditional and consumer-facing trades, marked by strong local roots or artisanal production, prioritize simple, accessible tools perceived as compatible with their expertise and available resources, such as digital communication tools for customer engagement and business operations (Natia et al., 2025). These adoption patterns reflect not only material constraints but also cultural representations of what it means to "innovate" in each craft sector. Technological choices are thus highly dependent on the context in which each sector evolves (Trenkle, 2020), underscoring the value of developing theoretical DT approaches adapted to the specific realities of each sector (OECD, 2021).

4.2 Digital Technologies in Craft Businesses: Purposes, Impact Types, and Sectoral Differences

The results presented here are based on detailed coding of case applications (see Appendix C), which document sector-specific technologies, categorized impact types, and affected value dimensions. Our results show that CBs have been adopting digital technologies for various purposes, with the intended impact of DT varying across craft sectors and degrees of integration. For instance, digital technologies with simulation and modeling capabilities, such as CAD software, computational and parametric design software, and other simulation tools, have been long utilized within the Architecture and Interior Design industry. A similar trend in case studies in Carpentry and Construction can be observed, where technologies such as CAD software and structural sensors were already applied during the early 2000s. These observations suggest a standing industrial emphasis on DT impacting process alignment and product development. However, more recent applications of AR/VR, AI-supported robotic systems, and IoT technologies enable other impact types such as enhancing staff empowerment and customer relations. Alternatively, case studies involving the Personal Care and Aesthetics industry have all been published recently, i.e., from 2018 to 2024, suggesting a more recent uptake of employing digital tools and technologies. Given the nature of this sector, the technologies adopted are mostly impacting customer relations and marketing, as well as product development and process alignment.

Our analysis also shows that 47.7% of cases primarily implement digital tools for value creation, focusing on process optimization and operational efficiency (Gouveia et al., 2024). Meanwhile, 20.2% of cases use digital technologies to enhance the value proposition, supporting product development and market expansion (Cooper, 2019). Finally, only 7.1% of analyzed cases use digital tools to improve customer interaction, leveraging AI support, virtual trials, and personalized recommendations. This breakdown highlights that many CBs adopt digital technologies focusing on optimizing processes, improving customer engagement, or expanding their value proposition.

However, other CBs take a more integrated approach, not limiting digital tools to a single function. Digital technologies are leveraged for multiple purposes, maximizing their impact across various areas of operations and strategy. For example, 10.7% of the cases reveal the use of digital technologies that impact both value creation and value proposition, while 4.8% integrate tools that promote both customer interaction and value creation. Finally, 9.5% of companies use technologies that simultaneously influence customer interaction and the value proposition, reflecting a strategic approach to DT. For example, the jewelry sub-sector integrates AI to optimize inventory management while providing personalized recommendations, aligning with customer interaction and value creation. Similarly, the construction sector uses IoT for GPS and RFID-based asset tracking, simultaneously impacting value creation and the value proposition by improving operational efficiency and project management.

Finally, our analysis also highlights a distribution of DT dimensions that varies across craft sectors (see Table 4 and Appendix E for a graph representation). Some sectors adopt digital technologies primarily to create value, particularly traditional industries such as basketry, ceramics, and pottery. These sectors focus on using digital

tools to improve precision, streamline production, and maintain traditional craftsmanship while enhancing efficiency (Zoran, 2013; Überbacher et al., 2020). Other sectors employ digital technologies to achieve a more diversified impact. Construction, textiles, and fashion, as well as the plumbing, heating, and electrical industries stand out as sub-sectors that leverage multiple digital tools for all three DT dimensions. These sectors integrate several technologies such as AI, IoT and AR/VR to optimize processes, improve customer engagement, and expand business opportunities (Casciani and Chkanikova, 2023; Trummer, 2023; Institute for TMDT, 2025). The findings suggest that DT in CBs is not a one-size-fits-all process but is shaped by sector-specific demands and perceived technological advantages.

Table 4. Application Fields of Digital Technologies across Craft Sectors

Craft Sectors	Value Proposition	Value Creation	Value Creation & Proposition	Customer Interaction & Value Proposition	Customer Interaction & Value Creation	Customer Interaction	Total
Textile, Fiber Arts, and Footwear	5	7	2	6		2	22
Architecture and Design	4	7	2	1	1	3	18
Food and Beverages	3	5	1				9
Personal Care and Aesthetics	1	3	1	4	6	3	18
Construction	2	16	3				21
Traditional Handicraft	5	7	1				13
Total	20	45	10	11	7	8	101

5 Conclusion and Next Steps

This paper maps out literature on DT in the craft industry, revealing diverse adoption patterns across sectors. Our findings contribute to an increased awareness of digital technologies implemented in each craft sector, their specific functions, and the types of DT dimension to which the usage of these digital tools contribute.

Our analysis shows that innovative technologies of all kinds (communication and other enabling technologies, intelligent systems, and data technologies) are used in all craft sectors for various purposes. Despite prior assumptions that the craft industry lags in DT (Kocak & Pawlowski, 2023), our findings confirm that CBs apply digital technologies to improve efficiency and competitiveness (Morakanyane et al., 2017; Schwertner, 2017). Some CBs integrate advanced tools like AI, 3D printing, and IoT, and many rely on communication and other interaction-enabling technologies for marketing and sales. Many CBs leverage digital solutions both for operational efficiency and to enhance customer interaction and product innovation. While adoption is uneven across sectors, digital technology use often exceeds initial assumptions.

Our findings thus suggest that the issue lies not in a shortage of creativity and openness towards DT but in the absence of early to late adopters. As highlighted by previous research, the pace of adoption is limited by barriers such as cost, technical expertise, structural concerns, and cultural resistance (e.g. Überbacher et al., 2020). Similarly, the industry's structure, which is predominantly comprised of small

companies, and existing rural-urban disparities (Busch et al., 2021; Thonipara et al., 2023) contribute to these barriers. Only some companies can readily innovate, try out new digital technologies, and thus act as early adopters of digital technologies. While other digital technologies, such as CAD software, CRM, and ERP systems, have become established in certain sub-sectors, well-established best practices employing the most recent digital technologies are still lacking due to the scattered craft landscape.

Mapping out the extent of digital technology application showcases how and in which sectors innovative digital technologies can be used for various purposes. Our findings provide a foundation for evaluating the current condition and future initiatives of CBs concerning DT vis-à-vis current trends in their corresponding sector or sub-sector. Moreover, CBs are enabled to consciously choose and capitalize on the most suitable technologies for their business model, resources, and short- and long-term DT goals. For instance, the analysis reveals distinct sectoral patterns of technological adoption influenced by functional objectives, business constraints, and cultural representations specific to each sector. By demonstrating that adoption patterns can also vary according to sector types and specificities (Trenkle, 2020), our results underscore the need for more context-specific DT frameworks for the crafts industry, rather than applying a universal DT model (OECD, 2021; WEF, 2024).

The analysis also highlights a pattern across sectors of CBs adopting technologies to create value. In most cases, CBs are from process-driven sectors (construction, textile, food and beverage) that tend to focus on value-creation technologies that improve efficiency in production or logistics, as they directly align with their operational priorities and offer tangible, short-term returns. Meanwhile, value proposition and customer interaction technologies can be perceived as less immediately relevant or harder to implement, particularly in sectors where the business model is rooted in craftsmanship rather than service or branding. However, by overlooking tools that support customer interaction or help articulate a clear value proposition, CBs unconsciously hinder differentiation, loyalty, and long-term growth (Matarazzo et al., 2020). A more balanced approach would enable them to not only improve production but also strengthen customer engagement and their market positioning.

Finally, although our data do not enable us to analyze rural-urban disparities, recent research suggests that such factors shape digital adoption patterns across the craft industry. Rural CBs often face limited digital infrastructure and weaker access to support services (Thonipara et al., 2023), reducing the likelihood of adopting Communication and Other Enabling Technologies and Data Technologies that rely on strong connectivity and are essential for customer interaction and value proposition. In contrast, Technologies Combining Hardware and Software in Intelligent Systems like mobile devices or offline-capable production technologies may be more accessible to rural firms, especially when focused on internal process improvements. Future research could explore how these disparities interact with sectoral specificities and propose targeted strategies, such as localized digital training, infrastructure support, or rural-urban collaboration networks to bridge adoption gaps.

Overall, our findings challenge linear models of DT in SMEs and call for deeper analyses of emerging technology adoption in the craft industry. Further research is

needed to assess the extent of use, benefits, and challenges of specific digital technologies within a specific craft sector or sub-sector. Future studies can examine how adoption can be pushed by analyzing how and which factors (e.g., perceptions of creativity, readiness to change, profitability of innovative solutions) influence adoption decisions, considering geographical aspects (rural vs. urban). A promising way to achieve this lies in studying neo-craft businesses, as they have successfully integrated digital technologies without compromising craft values, proving that digitization can align with tradition. These CBs often adopt tools not only for economic reasons but also in response to identity-related, cultural, or symbolic logics (Leonardi & Pareschi, 2025). Understanding their impacts and motivations can inspire wider adoption and support the development of more nuanced, context-sensitive DT theories tailored to CBs while offering insights into why some technologies are more adopted than others.

For broader research and applied directions, practitioners and researchers are encouraged to investigate neo-craft businesses and early adopters who can serve as potential tech leads of specific digital technologies in each craft sub-sector. This also means tapping on existing skilled trades communities and networks in nearby regions (i.e., especially among rural areas) to encourage more strategic tech adoption initiatives. These could be collaborative experimentations and explorations for best practices or rural-urban synergies that can potentially lessen regional disparities.

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7 Appendices

Appendix A: List of Keywords Used for Data Collection
https://osf.io/3ye47?view_only=25b1edd1545d48b9ab0adb1837f60045

Appendix B: Coding Framework for Technology Classification
https://osf.io/aghzj?view_only=25b1edd1545d48b9ab0adb1837f60045

Appendix C: Digital Technology Adoption & Intended Impact in Craft Businesses
https://osf.io/f6uz3?view_only=25b1edd1545d48b9ab0adb1837f60045

Appendix D: Supporting References for Appendix C
https://osf.io/zp79v?view_only=25b1edd1545d48b9ab0adb1837f60045

Appendix E: Visual Representations of Findings
https://osf.io/c3aj8?view_only=25b1edd1545d48b9ab0adb1837f60045

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